

IN THE CLAIMS

Please amend the claims as follows:

Claim 1. (Currently Amended) A fuel cell output characteristic estimating apparatus for estimating an output characteristic of a fuel cell which has been used for an extended period of time, comprising:

a current-voltage detector that detects an output current of the fuel cell and a voltage between terminals of the fuel cell which has been used for an extended period of time; and

a controller that estimates the output characteristic of the fuel cell which has been used for an extended period of time on the basis of the detected output current and the detected voltage between the terminals, detected by the current-voltage detector, and a predetermined basic output characteristic of the fuel cell.

Claim 2. (Original) A fuel cell output characteristic estimating apparatus according to claim 1, wherein the controller derives the basic output characteristic from at least one of a fuel supply pressure applied to the fuel cell and a temperature of the fuel cell.

Claim 3. (Original) A fuel cell output characteristic estimating apparatus according to claim 2, wherein the controller derives the basic output characteristic from an output characteristic of the fuel cell corresponding to at least one of the fuel supply pressure applied to the fuel cell and the temperature of the fuel cell, and an internal resistance of the fuel cell corresponding to the temperature of the fuel cell.

Claim 4. (Original) A fuel cell output characteristic estimating apparatus according to claim 1, wherein the controller estimates an internal resistance of the fuel cell on the basis of the detected output current, the detected voltage between the terminals, and the basic output

characteristic, and estimates the output characteristic of the fuel cell on the basis of the estimated internal resistance of the fuel cell.

Claim 5. (Original) A fuel cell output characteristic estimating apparatus according to claim 2, wherein the controller estimates an internal resistance of the fuel cell on the basis of the detected output current, the detected voltage between the terminals, and the basic output characteristic, and estimates the output characteristic of the fuel cell on the basis of the estimated internal resistance of the fuel cell.

Claim 6. (Original) A fuel cell output characteristic estimating apparatus according to claim 3, wherein the controller estimates the internal resistance of the fuel cell on the basis of the detected output current, the detected voltage between the terminals, and the basic output characteristic, and estimates the output characteristic of the fuel cell on the basis of the estimated internal resistance of the fuel cell.

Claim 7. (Original) A fuel cell output characteristic estimating apparatus according to claim 6, wherein the controller estimates the output characteristic of the fuel cell on the basis of the output characteristic corresponding to at least one of the fuel supply pressure applied to the fuel cell and the temperature of the fuel cell, and the estimated internal resistance.

Claim 8. (Currently Amended) A fuel cell system having a fuel cell which has been used for an extended period of time, the fuel cell system comprising:

a fuel cell output characteristic estimating apparatus for estimating an output characteristic of the fuel cell which has been used for an extended period of time, including a

current-voltage detector that detects an output current of the fuel cell and a voltage between terminals of the fuel cell, and a controller that:

estimates the output characteristic of the fuel cell on the basis of the detected output current and the detected voltage between the terminals, detected by the current-voltage detector, and a predetermined basic output characteristic of the fuel cell;

sets a target output of the fuel cell using the output characteristic of the fuel cell estimated by the controller; and

adjusts an output of the fuel cell such that the set target output is generated by the fuel cell.

Claim 9. (Original) A fuel cell system according to claim 8, further comprising:

a power supply that supplies electric power to and receives the electric power from the fuel cell system, wherein:

the controller sets the target output of the fuel cell on the basis of an output required to be generated by the fuel cell system; and

when the set target output of the fuel cell is in excess of or short of the required output of the fuel cell system, the controller changes supply of the electric power to or from the power supply.

Claim 10. (Original) A fuel cell system according to claim 9, wherein the controller includes a transformer that is connected to terminals of the power supply and transforms the voltage between the terminals of the power supply so as to be applied to output terminals of the fuel cell.

Claim 11. (Original) A fuel cell system according to claim 8, wherein the controller changes the voltage between the terminals of the fuel cell into a voltage corresponding to the set target output.

Claim 12. (Original) A fuel cell system according to claim 9, wherein the controller changes the voltage between the terminals of the fuel cell into a voltage corresponding to the set target output.

Claim 13. (Original) A fuel cell system according to claim 10, wherein the controller changes the voltage between the terminals of the fuel cell into a voltage corresponding to the set target output.

Claim 14. (Withdrawn/Currently Amended) A vehicle comprising a fuel cell system which has been used for an extended period of time, the fuel cell system comprising:

a fuel cell;

a fuel cell output characteristic estimating apparatus for estimating an output characteristic of the fuel cell which has been used for an extended period of time, including a current-voltage detector that detects an output current of the fuel cell and a voltage between terminals of the fuel cell, and a controller that:

estimates the output characteristic of the fuel cell on the basis of the detected output current and the detected voltage between the terminals, detected by the current-voltage detector, and a predetermined basic output characteristic of the fuel cell;

sets a target output of the fuel cell using the output characteristic of the fuel cell estimated by the controller; and

adjusts an output of the fuel cell such that the set target output is generated by the fuel cell.

Claim 15. (Withdrawn) A vehicle according to claim 14, wherein the fuel cell system further comprises a power supply that supplies electric power to and receives the electric power from the fuel cell system, wherein:

the controller sets the target output of the fuel cell on the basis of an output required to be generated by the fuel cell system; and

when the set target output of the fuel cell is in excess of or short of the required output of the system, the controller changes supply of the electric power to or from the power supply.

Claim 16. (Withdrawn) A vehicle according to claim 15, wherein the controller includes a transformer that is connected to terminals of the power supply and transforms the voltage between the terminals of the power supply so as to be applied to output terminals of the fuel cell.

Claim 17. (Withdrawn) A vehicle according to claim 14, wherein the controller changes the voltage between the terminals of the fuel cell into a voltage corresponding to the set target output.

Claims 18-39. (Cancelled).

Claim 40. (New) A fuel cell output characteristic estimating apparatus for estimating an output characteristic of a fuel cell, comprising:

a current-voltage detector that detects an output current of the fuel cell and a voltage between terminals of the fuel cell; and

a controller that estimates the output characteristic of the fuel cell on the basis of the detected output current and the detected voltage between the terminals, detected by the current-voltage detector, and a predetermined basic output characteristic of the fuel cell, wherein the predetermined basic output characteristic is a function of an internal resistance of the fuel cell.

Claim 41 (New) A fuel cell system having a fuel cell, the fuel cell system comprising:

a fuel cell output characteristic estimating apparatus for estimating an output characteristic of the fuel cell, including a current-voltage detector that detects an output current of the fuel cell and a voltage between terminals of the fuel cell, and a controller that:

estimates the output characteristic of the fuel cell on the basis of the detected output current and the detected voltage between the terminals, detected by the current-voltage detector, and a predetermined basic output characteristic of the fuel cell, wherein the predetermined basic output characteristic is a function of an internal resistance of the fuel cell;

sets a target output of the fuel cell using the output characteristic of the fuel cell estimated by the controller; and

adjusts an output of the fuel cell such that the set target output is generated by the fuel cell.

Claim 42. (New) A vehicle comprising a fuel cell system, the fuel cell system comprising:

a fuel cell;

a fuel cell output characteristic estimating apparatus for estimating an output characteristic of the fuel cell, including a current-voltage detector that detects an output current of the fuel cell and a voltage between terminals of the fuel cell, and a controller that:

estimates the output characteristic of the fuel cell on the basis of the detected output current and the detected voltage between the terminals, detected by the current-voltage detector, and a predetermined basic output characteristic of the fuel cell, wherein the predetermined basic output characteristic is a function of an internal resistance of the fuel cell;

sets a target output of the fuel cell using the output characteristic of the fuel cell estimated by the controller; and

adjusts an output of the fuel cell such that the set target output is generated by the fuel cell.